

CLAIMS

1. Control system for a hydraulic cylinder comprising a cylinder chamber (8), a piston head (12) and a piston rod (13), which control system (14) comprises a fluid line (20) between at least one side of the hydraulic cylinder's piston head (12) and a source of hydraulic fluid, which fluid line (20) comprises at least in a part two parallel lines (20a, 20b) in which one of the lines (20a) there is arranged a pump (22), wherein the other parallel line (20b) comprises a control element (21, 25), which allows less fluid through the line (20b) in the opposite direction of the pump (22), than the pump in the other line (20a) when the pump is running.
- 10 2. Plug for closing off a pipe (1), comprising anchoring (3) and sealing (4) devices operated by at least one hydraulic cylinder (8) with a control system (14) for setting and/or releasing the plug (2), which control system (14) comprises fluid line (20) between at least one side of the hydraulic cylinder's piston head (12) and a source of hydraulic fluid, wherein the fluid line (20) comprises two parallel lines (20a, 20b) in which one of the lines (20a) there is arranged a pump (22), and the other parallel line (20b) comprises a control element (21, 25), which allows less fluid through the line (20b) than the pump (22) in the other line (20a) when the pump is running.
- 15 3. Control system or plug according to one of the preceding claims, wherein the control element is a valve (21) with at least an open and closed position, where its neutral position is open.
- 20 4. Control system or plug according to claim 1 or 2, wherein the control element is a restriction orifice.
- 25 5. Control system or plug according to claim 3, wherein the valve (21) with energy feed will be switched to a closed position.
6. Control system or plug according to one of the preceding claims, wherein the source of hydraulic fluid is an accumulation tank and/or the void on the other side of the piston head (21).
- 30 7. Control system or plug according to one of the preceding claims, wherein the hydraulic cylinder has a piston rod (13) running through both sub chambers of said cylinder chamber (11).
8. Control system or plug according to one of the preceding claims, wherein the fluid lines (20) for the control system (14) is connected to the cylinder chamber (11) on both sides of said piston head (12).

9. Control system or plug according to one of the preceding claims, wherein hydraulic cylinder (8) is preloaded to return to a neutral position where the anchoring means (3) are in a retracted position.
10. Control system or plug according to claim 9, wherein the preloading is provided by at least one spring (15) between an endplate (5) of the plug and an endplate (10) of the hydraulic cylinder (8).
11. Control system or plug according to one of the claims 2,3 or 5-8 wherein the pump (22) is a two-way pump.
12. Plug according to one of the claims 2-11, wherein the plug comprises a first endplate (5) and a second endplate (6), a cylinder chamber (11) connected to the second endplate (6), which cylinder chamber (11) comprises a piston head (12) with a piston rod (13), which runs through said piston head (12) and through whole of said cylinder chamber (11), sealing means (4) in form of a packer arranged in abutment to an inner side of said first endplate (6), and a first part of said anchoring means (3) in the form of a first wedge behind said packer, a second part of said anchoring means (3) provided partly outside said first part of said anchoring means (3) and in abutment against the first endplate (5) of said plug, where said first endplate (5) is connected to said piston rod (13).
13. Method for setting a plug (2) in a pipe (1), which plug (2) comprising anchoring (3) and sealing (4) devices operated by at least one hydraulic cylinder (8) with a control system (14) comprising fluid lines (20) from at least one side of the hydraulic cylinder's piston head (12) to the other side of said piston head (12) and/or an accumulation tank and in the fluid lines (20) a pump (22) with a motor (23), and in parallel with the pump (22) a valve (21) wherein,
 - 25 - inserts the plug (2) in the pipe (1),
 - move it to the required position in the pipe (1),
 - activate setting procedure by starting said pump (22) and build a necessary setting pressure in the hydraulic cylinder (8),
 - relieve the pressure on one side of said plug (2) until a sufficient differential pressure established across the plug (2).
14. Method according to claim 12, wherein when starting said pump the valve (21) is set in a closed position, and after a sufficient differential pressure is established stop the pump (22) and release the valve (21) to its neutral position, an open position.
- 35 15. Method for releasing a plug (2) in a pipe (1), which plug (2) comprising anchoring (3) and sealing (4) devices operated by at least one hydraulic cylinder (8),

with a control system (14) comprising fluid lines (20) from at least one side of the hydraulic cylinder's piston head (12) to an accumulation tank and or to the other side of said piston head (12), and in the fluid lines (20) a pump (22) with a motor (23), and in parallel with the pump (22) a valve (21) where the valve (21) in its

5 neutral position is open, wherein

building pressure on the non-pressure side of said plug (2),

when said pressure reaches a value will the preloaded hydraulic cylinder (8), with the open valve (21) in the control system (14), move the anchoring means (3) to a retracted position and the plug (2) is free.

10 16. Method according to claim 9, wherein the valve (21) is set to a closed position and the pump (22) is run in an opposite direction and the hydraulic cylinder (8) retracts the anchoring means (8).